What is claimed is:

1. A waveform data analysis method comprising:

a step of performing a filter process for removing components of a predetermined frequency band from original waveform data; and

a step of determining dividing positions of the original waveform data on the basis of envelope levels of the waveform data having been subjected to said filter process.

2. A waveform data analysis method as claimed in claim 1 which is intended to establish waveform data control points when control is to be performed to compress or expand the original waveform data on a time axis, and wherein the dividing positions determined by said step of determining are set as the waveform data control points.

3. A waveform data analysis method comprising:

a step of performing a filter process for removing components of a predetermined frequency band from original waveform data;

a step of detecting an envelope of the waveform data having been subjected to the filter process; and

a step of determining dividing positions of the original waveform data on the basis of differentiation of the envelope detected by said step of detecting.

4. A waveform data analysis method as claimed in claim 3 which further comprises an amplitude conversion step of reducing an amplitude level difference in the detected envelope, and

wherein said step of determining dividing positions determines the dividing positions of the original waveform data on the basis of differentiation of the envelope having been processed by said amplitude conversion step.

5. A waveform data analysis method as claimed in claim 3 wherein said step of determining dividing positions includes a step of detecting peak levels corresponding to the determined dividing positions.

6. A waveform data analysis method as claimed in claim 3 which further comprises a step of setting a time difference (Td) between a reproduction start time point of the original waveform data and a start time point of a given dividing position of the original waveform data as

$$Td = n(Ts + Tt) - Tt$$

, where Ts represents an original time difference between a reproduction start position of the original waveform data and a start position of the given dividing position, Tt represents an original time difference between the given dividing position and a peak position where a peak level corresponding to the given dividing position occurs, and n represents an expansion/compression ratio of a reproducing tempo at which the original waveform data are to be

reproduced.

7. A waveform data analysis method as claimed in claim 6 which further comprises:

a step of starting reproduction of the original waveform data at the reproduction start position; and

a step of starting reproduction of the original waveform data at and after the given dividing position upon passage of the set time difference (Td) after the reproduction of the original waveform data is started.

8. A computer program comprising computer program code means for performing all the steps of claim 1 when said program is run on a computer.

9. A computer program comprising computer program code means for performing all the steps of claim 3 when said program is run on a computer.

10. A waveform data analysis apparatus comprising:

a storage device that stores original waveform data; and

a processor coupled with said storage device and adapted to:

read out the original waveform data from said storage device and perform a filter process for removing components of a predetermined frequency band from the original waveform data; and

determine dividing positions of the original waveform data on the basis of envelope levels of the waveform data having been subjected to said filter process.

11. A waveform data analysis apparatus as claimed in claim 10 wherein said processor is further adapted to store, in said storage device, data indicative of the determined dividing positions, and said processor makes available the data indicative of the dividing positions when the original waveform data stored in said storage device are to be reproduced.

12. A waveform data analysis apparatus comprising:

a storage device that stores original waveform data; and

a processor coupled with said storage device and adapted to:

read out the original waveform data from said storage device and perform a filter process for removing components of a predetermined frequency band from the original waveform data;

detect an envelope of the waveform data having been subjected to the filter process; and

determine dividing positions of the original waveform data on the basis of differentiation of the detected envelope.

13. A waveform data analysis method comprising:

a step of determining presumed beat positions in original waveform data;

a step of detecting rise positions in the original waveform data within predetermined ranges corresponding to the presumed beat positions determined by said step of determining; and

a step of extracting any one of the rise positions, detected by said step of detecting, as a dividing position of the original waveform data.

14. A waveform data analysis method as claimed in claim 13 wherein a plurality of the predetermined ranges are provided in the original waveform data at equal intervals.

15. A waveform data analysis method as claimed in claim 13 wherein a plurality of the predetermined ranges are provided in the original waveform data in correspondence with a rhythm with which the original waveform data were recorded.

16. A waveform data analysis method as claimed in claim 13 wherein a plurality of the predetermined ranges are provided in the original waveform data, and

wherein said step of extracting includes a first extraction step of, for each of the predetermined ranges, extracting the rise position as the dividing position on

condition that level values corresponding to the rise position belonging to the predetermined range exceed a predetermined first threshold value.

17. A waveform data analysis method as claimed in claim 16 wherein said step of extracting includes a second extraction step of, for any of the predetermined ranges where no rise position was not extracted by said first extraction step, extracting the rise position as the dividing position on condition that corresponding level values exceed a second threshold value smaller than said first threshold value.

18. A waveform data analysis method comprising:

a step of detecting rise positions in original waveform data; and

a step of selecting one rise position from among one or more rise positions detected by said step of detecting within a predetermined range of the original waveform data and extracting the selected rise position as a dividing position of the original waveform data.

19. A waveform data analysis method as claimed in claim 18 wherein a plurality of the predetermined ranges are provided in the original waveform data at equal intervals.

20. A waveform data analysis method as claimed in claim

18 wherein a plurality of the predetermined ranges are provided in the original waveform data in correspondence with a rhythm with which the original waveform data were recorded.

21. A waveform data analysis method as claimed in claim 18 wherein a plurality of the predetermined ranges are provided in the original waveform data, and

wherein said step of extracting includes a first extraction step of, for each of the predetermined ranges, extracting the rise position as the dividing position on condition that level values corresponding to the rise position belonging to the predetermined range exceed a predetermined first threshold value.

22. A waveform data analysis method as claimed in claim 21 wherein said step of extracting includes a second extraction step of, for any of the predetermined ranges where no rise position was not extracted by said first extraction step, extracting the rise position as the dividing position on condition that corresponding level values exceed a second threshold value smaller than said first threshold value.

23. A computer program comprising computer program code means for performing all the steps of claim 13 when said program is run on a computer.

24. A computer program comprising computer program code means for performing all the steps of claim 18 when said program is run on a computer.

25. A waveform data analysis apparatus comprising:

a storage device that stores original waveform data; and

a processor coupled with said storage device and adapted to:

determine presumed beat positions in the original waveform data;

detect rise positions in the original waveform data within predetermined ranges corresponding to the determined presumed beat positions; and

extract any one of the detected rise positions as a dividing position of the original waveform data.

26. A waveform data analysis apparatus comprising:

a storage device that stores original waveform data; and

a processor coupled with said storage device and adapted to:

detect rise positions in the original waveform data; and

select one rise position from among one or more rise positions detected within a predetermined range of the original waveform data and extract the selected rise position as a dividing position of the original waveform

data.

27. A waveform data analysis method comprising:

a step of reproducing automatic performance information;

a step of storing waveform data in parallel with reproduction of the automatic performance information; and

a step of storing synchronization control data indicative of relationship in processing timing between the automatic performance information and the waveform data, in correspondence with storage of the waveform data.

28. A waveform data analysis method as claimed in claim 27 which further comprises:

a step of detecting envelope levels of the waveform data; and

a step of determining dividing positions of the waveform data on the basis of the synchronization control data and the envelope levels detected by said step of detecting envelope levels.

29. A waveform data analysis method as claimed in claim 28 wherein said step of determining dividing positions includes:

a step of determining presumed dividing positions of the waveform data on the basis of the automatic performance information and the synchronization control data;

a step of detecting rise positions in the waveform

data within predetermined ranges corresponding to the presumed dividing positions; and

a step of extracting any of the rise positions, detected by said step of detecting rise positions, as a dividing position of the waveform data.

30. A waveform data analysis method as claimed in claim 29 wherein said step of determining presumed dividing positions determines the presumed dividing positions of the waveform data on the basis of beat timing, note-on timing or note-off timing of the automatic performance information.

31. A waveform data analysis method as claimed in claim 29 wherein said step of extracting any of the rise positions as the dividing positions on the basis of characteristics of the detected rise positions.

32. A waveform data analysis method as claimed in claim 27 which further comprises:

a step of determining presumed beat positions on the basis of the automatic performance information and the synchronization control data; and

a step of determining dividing positions of the waveform data on the basis of the presumed beat positions.

33. A waveform data analysis method as claimed in claim

27 which further comprises:

a step of determining presumed beat positions on the basis of note-on timing of the automatic performance information and the synchronization control data; and

a step of determining dividing positions of the waveform data on the basis of the presumed beat positions.

34. A waveform data analysis method as claimed in claim 27 which further comprises:

a step of determining presumed beat positions on the basis of the automatic performance information and the synchronization control data;

a step of analyzing portions of the waveform data near the presumed beat positions; and

a step of determining dividing positions in a whole of the waveform data on the basis of a result of analysis by said step of analyzing.

35. A waveform data analysis method as claimed in claim 34 wherein said step of analyzing detects rise positions by analyzing an envelope of the waveform data.

36. A waveform data analysis method as claimed in claim 34 wherein said step of determining dividing positions determines one dividing position for each of the presumed beat positions on the basis of a plurality of the rise positions included in the result of analysis by said step

of analyzing.

37. A waveform data analysis method as claimed in claim 27 wherein tempo clocks of the automatic performance information and sampling cycles of the waveform data are synchronized with each other, and the synchronization control data include timing data indicative of timing for starting storage of the waveform data.

38. A waveform data analysis method as claimed in claim 27 wherein the synchronization control data include timing data indicative of timing for starting storage of the waveform data, and synchronization data to synchronize tempo clocks of the automatic performance information and sampling cycles of the waveform data.

39. A computer program comprising computer program code means for performing all the steps of claim 27 when said program is run on a computer.

40. A waveform data analysis apparatus comprising:

a storage device;

a reproduction device that reproduces automatic performance information;

an input device that inputs waveform data to be stored into said waveform data analysis apparatus; and

a control device coupled with said storage device, said reproduction device and said input device, said

control device being adapted to:

store the waveform data in said storage device in parallel with reproduction of the automatic performance information, and perform control to store, in said storage device, synchronization control data indicative of relationship in processing timing between the automatic performance information and the waveform data in correspondence with storage of the waveform data.

41. A waveform data processing method comprising:

a step of dividing original waveform data into a plurality of sections; and

a step of adding waveform data of an additional section to an end of a selected one of the sections divided from the original waveform data by said step of dividing, the waveform data of the additional section attenuating, with passage of time, from an initial value equal to an envelope level at the end of the selected section.

42. A waveform data processing method as claimed in claim 1 which further comprises a step of detecting an attenuation rate of the original waveform data in the selected section, and wherein the waveform data of the additional section are imparted with attenuation characteristics based on the attenuation rate detected by said step of detecting.

43. A waveform data processing method comprising:

a step of dividing original waveform data into a plurality of sections;

a step of, in correspondence with the sections divided from the original waveform data by said step of dividing, previously generating and storing waveform data of additional sections to be added to individual ones of the divided sections;

a step of, when a reproducing tempo is faster than a predetermined standard, using the original waveform data of the individual divided sections to reproduce a waveform without using the waveform data of the additional sections; and

a step of, when the reproducing tempo is slower than the predetermined standard, reproducing a waveform by adding the waveform data of corresponding ones of the additional sections to the divided sections to follow the waveform data of the divided sections.

44. A waveform data processing method as claimed in claim 43 wherein the predetermined standard is an original tempo of the original waveform data.

45. A computer program comprising computer program code means for performing all the steps of claim 41 when said program is run on a computer.

46. A computer program comprising computer program code

means for performing all the steps of claim 43 when said program is run on a computer.

47. A waveform data analysis apparatus comprising:

a storage device that stores original waveform data; and

a processor coupled with said storage device and adapted to:

divide original waveform data into a plurality of sections; and

add waveform data of an additional section to an end of a selected one of the divided sections, the waveform data of the additional section attenuating, with passage of time, from an initial value equal to an envelope level at the end of the selected section.

48. A waveform data analysis apparatus comprising:

a storage device that stores original waveform data; and

a processor coupled with said storage device and adapted to:

divide original waveform data into a plurality of sections;

in correspondence with the divided sections, previously generate and store waveform data of additional sections to be added to individual ones of the divided sections;

when a reproducing tempo is faster than a

predetermined standard, use the original waveform data of the individual divided sections to reproduce a waveform without using the waveform data of the additional sections; and

when the reproducing tempo is slower than the predetermined standard, reproduce a waveform by adding the waveform data of corresponding ones of the additional sections to the divided sections to follow the waveform data of the divided sections.